

Wright D. L., her father, on
The ethical foundations of
scientific study

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THE ETHICAL FUNCTIONS OF SCIENTIFIC STUDY.

AN ADDRESS

DELIVERED AT THE

ANNUAL COMMENCEMENT

OF THE

UNIVERSITY OF MICHIGAN,

JUNE 28, 1888.



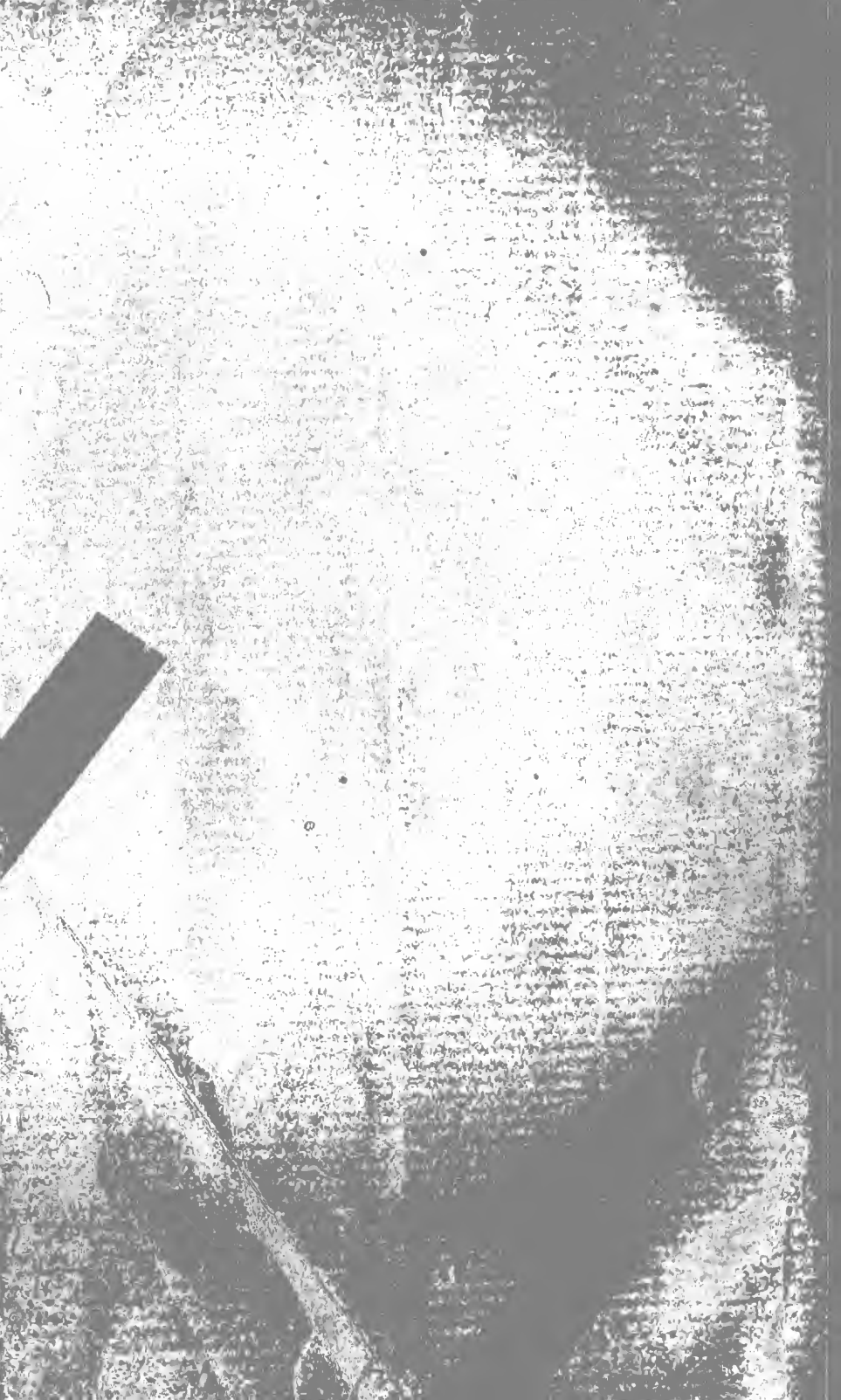
By Thomas C. Chamberlin, LL. D.,

PRESIDENT OF THE UNIVERSITY OF WISCONSIN.

ANN ARBOR, MICH.:

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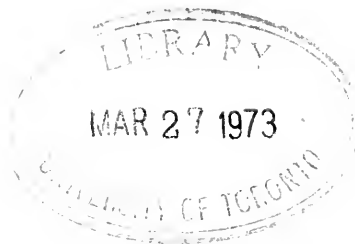
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THE COURIER PRINTING HOUSE, ANN ARBOR, MICH.

THE ETHICAL FUNCTIONS OF SCIENTIFIC STUDY.

Above all material acquisitions, above all intellectual attainments, above even the refinements of culture, in the esteem and endeavor of true educators, rises the moral exaltation of an individual or of a people. Whatever contributes to intellectual attainment rises in regard above material acquisition; whatever contributes to the refinements of thought rises above mere intellectual vigor; whatever contributes to moral elevation rises above all these. Whatever, therefore, enters into the curricula of our institutions of learning, invites judicial inquiry respecting its ethical character, tendencies and effects. I sympathize with those who esteem a devout and reverent spirit as loftier than all these, crowning them all; but that lies beyond and above our present theme.

It is not our habit to attach the idea of the moral to what we are accustomed to designate intellectual processes. We are wont to permit ourselves to regard certain mental activities as indifferent in moral character. Some activities do indeed betray an ethical nature less obtrusively than others. Unquestionably the feelings and the choices bring more distinctly into consideration than do the processes of the intellect the question whether their action is right and wholesome or indifferent or evil. Nevertheless it is here affirmed that a moral character attaches to our thinking as well as to our feeling and to our action. "As a man thinketh so is he." The swerving of the mind from absolute rectitude in any of its activities falls under ethical condemnation. Falsity in intellectual action is intellectual immorality. Narrow and loose habits of thought, prejudiced attitudes towards evidence, bias from

previous opinions and feelings, shallowness and superficiality in observation, and carelessness in reasoning are appropriate subjects of moral reproof. If, in the sharpest analysis, these are not purely intellectual, they are at least concomitants of our studies, and I therefore feel justified in designating them intellectual immoralities. If the purist in metaphysical distinctions shall insist that the ethical character resides in the emotional and volitional element that necessarily accompanies intellectual action, I shall make no issue with him. It is the actual concrete action of the mind and not its ultimate abstract analysis that concerns us in this discussion. The full sphere of moral completeness is only attained when the trinity, to think right, to feel right, and to do right, are joined in individual perfection to form an ethical unity.

I crave your indulgence, therefore, in the use of the terms moral and ethical in a sufficiently broad sense to embrace all falsity of mental action and all harmful processes of thought.

If you strike hands with me in this fundamental view, you cannot fail also to join in the affirmation that every intellectual activity that enters into our processes of education is a fit subject of inquiry respecting its inherent moral character and its ethical tendencies and results.

We shall plunge at once, however, into misunderstandings unless we agree upon a special meaning also for the phrase, scientific study. In common speech, science has come to signify merely physical or natural science. Let us set aside this common but narrow sense, and adopt the true and full meaning which embraces all specific systematized knowledge; not less knowledge of the mind and the humanities than of matter and its creatures. The objects of nature present tangible subjects of inquiry, governed by fixed and relatively simple laws, while mind and its products present profound intricacies, intangible factors, and the mystery of volition. The former have on this account offered the easier and thus far the more fruit-

ful field for the development of demonstrative knowledge, and hence the science of things physical and things natural sprang up earlier and grew more rapidly than the science of things mental and things artificial. It has therefore happened, not strangely, that the term science has come to be monopolized in common speech by knowledge of the physical world, ignoring the sciences of mind, of language, of civic institutions, of morals and of religions. But, unless the element of volition vitiates the reign of law, the systematic study of language, of history, of civic institutions, and of the mind itself, is, or at least should be, as truly scientific, in process and in product, as the study of earth or of air, of tree or of beast. As a disciple of "the gospel of dirt," I may, without suspicion of bias, urge that the simpler and lower shall not monopolize the insignia of superior knowledge, to the exclusion of the higher and more intimately human. By science, therefore, let us understand not merely physical and natural science, but *all* specific and systematic knowledge.

Even if the element of volition removes the products of mind from the strict domination of unchangeable law, it may be none the less profitable to subject them to the sharp discriminations, the severe questionings and the rigid inductions that mark scientific methods of study. It is not necessary to the scientific process to assume the rigid reign of law; on the contrary, the reign of law is rather an induction of science than its postulate.

There is another necessary discrimination, a distinction between *scientific study* and *the study of science*. By scientific study let us understand, not the subject matter, but the character of the study. Let it signify the exercise of those mental activities by which truth is discerned, and brought into orderly array in all its relationships. The study of science may be a mere memorizing of the products of scientific study, having in itself no more of the nature and spirit of scientific inquiry than the memorizing of John Gilpin, or the mastering of the figures of

a quadrille. To learn the results and the dicta of science involves an intellectual process essentially the same as learning the products of the imagination or the prices of commodities. In our university classes in science one student follows independently the processes by which the fabric of science was constructed. This is scientific study. Another student, ignoring these, leaps across the original processes to the final result, which alone he gathers into his comprehension and holds by an enforced action of the memory. This is knowledge gathering, not scientific inquiry. The former is a scientific student in the true sense; the latter is at best not more than a student *of* science. Let us agree therefore that, for the time at least, scientific study shall mean to us the study employed in the development of science, which the true scientific student imitates in the *seminar*, the laboratory, and the field.

The distinction between scientific study and the study of science is much the same as that between creative scholarship and acquisitive scholarship; between modern research and ancient erudition.

If now we are agreed that a moral character attaches to our thinking as well as to our feeling and our willing; and if we are further agreed that scientific study shall mean the intellectual processes that enter into the development of science, and that it shall not mean the mere conning of knowledge; and if we further agree that the physical sciences are only the more early ripened fruits of a broad intellectual field now whitening to the harvest, we may with less fear of parting company later, turn to the inquiry, what are the ethical aspects of scientific study, and what is its practical, though it be slow and distant, influence on some of the dominant evils of our times?

The essence of my argument will be this: scientific inquiry involves certain fundamental habits of thought. When these become fixed in the intellectual nature, they

form a permanent disposition which influences all the individual's subsequent action. That disposition displaces certain other dispositions from which spring some of the prevalent evils of our day, and by so displacing them, it radically affects the moral welfare of our people. It forestalls an immoral issue by wholesome and preventive antecedent action. Its influence is not so much curative as preventive. The earlier physicians concerned themselves with disease and its remedies; the later concern themselves with health and its conditions. To secure the universal remedy was the ancient endeavor; to secure universal health is the true endeavor. To *correct* harmful action is not so much an object of effort as to *prevent* it. Moral endeavor should be turned not so much to the remedial as to the preventive.

As educators we are coming to realize what the great captains long since learned, that entrenched positions are often to be flanked rather than assaulted directly. We may waste our forces and crown the enemy with triumph by direct onslaught, when we might, by more wisely directed efforts, ourselves bear away the fruits of victory. Direct moral denunciation and specific legislative prohibition have their important functions, but many great evils can best be eliminated by displacing immoral tendencies by wholesome dispositions, and by forestalling wrong action by inducing a dominant tendency to right action.

1. Let us first note certain characteristics of scientific study, and then turn to their application.

In scientific study, or, as I prefer to phrase it, in creative scholarship, the truth is the single end sought; all yields to that. The truth is supreme, not only in the vague mystical sense in which that expression has come to be a platitude, but in a special, definite, concrete sense. Facts and the immediate and necessary inductions from facts displace all pre-conceptions, all deductions from general principles, all favorite theories. Previous mental constructions are bowled over as childish play-structures by

facts as they come rolling into the mind. The dearest doctrines, the most fascinating hypotheses, the most cherished creations of the reason and of the imagination perish from a mind thoroughly inspired with the scientific spirit in the presence of incompatible facts. Previous intellectual affections are crushed without hesitation and without remorse. Facts are placed before reasonings and before ideals, even though the reasonings and the ideals be more beautiful, be seemingly more lofty, be seemingly better, be seemingly truer. The seemingly absurd and the seemingly impossible are sometimes true. The scientific disposition is to accept facts upon evidence, however absurd they may appear to our pre-conceptions.

2. This supreme love of truth is furthermore active and instinctive, not a mere passive, receptive love of truth when truth is forced in upon the mind. It arises in its own strength and in its own inspiration and goes forth to search for specific, positive, demonstrative truth. It is moved by a controlling thirst for truth, the naked, the innermost, the vital, the fundamental truth.

3. Moreover the activities of the ideal scientific mind do not go forth merely as an affection and as an enthusiasm, but also as a scrutinizing, questioning agency whose hatred of falsity is as great as its love of truth. Its first action is to demand the credentials of whatever offers itself for acceptance; if it be an observation, it is to be rigorously verified; if it be an induction, its validity is to be unsparingly probed; if it be a classification, its bases and its collocations are to be questioned; if it be a mental structure, the strength of every part is to be put to trial. If possible, the crucial tests of experimentation are to be brought to bear upon it. In the scientific structure every beam is to be tested, every joint is to be put to trial. The edifice is to be built on knowledge and not on faith; on proof and not on opinion. Conjectures, assertions, opinions, current impressions, pre-conceived notions, accepted doctrines, all alike are pushed aside to give free

scope to untrammelled inductions from carefully sifted evidence.

4. It is a further canon of creative scholarship that conclusions are to be withheld when evidence is insufficient. It is as important to withhold assent, when the proof is inadequate, as to yield assent when it is ample. The measure of acceptance in any case is precisely the measure of the evidence. In this regard the law of scholarship stands opposed to the law of action. Given two courses to be pursued upon which insufficient evidence sheds an uncertain light, the man of action, when action is required, will choose that course towards which the balance of evidence, however slight, inclines. The scholar, when scholarship is required, merely balances the evidence, determines the measure and direction of preponderance, and there rests his judgment. If 51 per cent. of such probabilities as there may be indicate that the one course is the true one, against 49 per cent. indicative that the other course is the right one, even though the total of indications be small, the law of action, when action is imminent, demands that the former should be chosen, and faith summoned to take the place of knowledge. But the law of scholarship demands that the evidence be simply evaluated as 51 to 49, and the judgment there rested with no conclusion and but slight tendency to belief, since 51 per cent. of such evidence as there is is far less than what there should be to justify an induction. The habit of withholding conclusions is therefore an essential factor in the trustworthy determination of knowledge.

5. A fifth and supreme characteristic of typical scientific study, is a judicial attitude of the mind. The supreme endeavor is to present a disposition of absolute fairness toward all evidence and all inductions. Belief and unbelief are alike unto it. Whatever evidence demands, that it accepts; whichever way the balance of evidence inclines, to that it leans. There is no resistance to

the leadings of evidence; there is no pressing of evidence to give it greater or less than its intrinsic weight. All lines of inquiry are pursued with equal avidity; all phenomena are welcomed with equal cordiality. The mind opens itself on all sides to all avenues of truth with equal impartiality.

This is indeed an ideal attitude. No one fully attains to it, no one is entirely free from the influence of predisposition. Complete impartiality is divine, not human. He who claims absolute freedom from bias, deceives himself; he who does not recognize the prejudices of his own mind becomes to that extent untrustworthy. The nearest approach to complete equipoise is attained when the mind, by earnest endeavor, frees itself to the utmost from the conditions that predispose it to partiality and constrains itself to the utmost to act with judicial fairness, and then, having done all to be impartial, measures up, so far as it may, its own bias and discounts its conclusions accordingly. It requires an almost preternatural self-inspection, and a lofty moral courage systematically to discount one's own work for one's own persistent errors. It crucifies the natural pride to turn upon one's self the same severe probing for weakness that one applies to others.

The astronomers, geodesists and other precise observers have set us an example worthy of imitation in all departments of thought. It is their practice to ascertain by careful tests their habitual errors, and then to correct their results as conscientiously for their own personal defects as for the systematic errors of their instruments. This application of the personal equation should be extended beyond the field of observation and applied to all impressions, inferences, interpretations, inductions and opinions. It is indeed less easy to determine the personal error in these more recondite and complex processes of the mind, but the effect is none the less wholesome, none the less important to trustworthy results.

These are some of the dominant traits of mind that mark creative scholarship; to love the truth supremely, to seek the truth assiduously, to scrutinize evidence rigorously, to withhold judgment when evidence is insufficient, to look upon all sides equally, to judge with impartiality, and to make conscientious corrections for personal bias.

I have sketched these qualities as they are involved in pioneer research, but they are, or should be, equally involved in the training of the university student whose work may be but *quasi*-original. The school work may be only secondary or imitative research, but it may and should have in itself all the essential qualities of original investigation. The minor problems, the tests and the determinations of the student in the laboratory, the field, and the *seminar* may and should involve the same mental and moral characteristics as the more weighty work of the true discoverer. The scientific child in training should foreshadow the scientific man in creative work.

The continuous exercise of the mind during its formative stages in these sterling activities and in these scrupulous attitudes, and the development of corresponding habits of mental action have a direct bearing upon two of the great sources from whence spring reprehensible action, namely, defective and warped thinking and deficient regard for strict truth. These are not the only sources of blameworthy action, and the intellectual training under consideration is not the only remedy. The whole field of wrong-doing is not before us for consideration either in cause or cure. It is my effort only to point out the hygienic and preventive agency of a special phase of intellectual training. Let me not be understood as advocating a panacea.

A much larger percentage of reprehensible action springs from defective perception and interpretation than we are wont to realize. While this is true of those graver misdeeds that rank as crimes, it is much more widely true

of those blameworthy actions which are not under the restraint of law or the forms of society. The "misunderstandings" that lead to broils and end in the crack of pistols are indeed *misunderstandings* in a large percentage of cases, and would never occur, even with the belligerent dispositions that prompt them, if clearer perceptions and truer interpretations replaced the dull apprehension and the twisted mental action that go before the passion and give it occasion. In a careful analysis of criminal cases it will be found of many, I think, that at some point in their history defective and distorted perception and interpretation constituted determining factors, and that had these been replaced by more complete and accurate understanding, the issue would have been reversed. I am far from maintaining that defective intelligence is the supreme factor in misdeeds. Morality must be advanced by other appliances than superior intellectual training. It is something to us, however, if this yields an important contribution to the exaltation of morals.

But the discussion of criminality is apart from my purpose. This is the weakest aspect of my subject. However beneficent investigative study may be, the ignorant criminal classes are the most remote from its influence, and the last to be reached by it. Law and public opinion must be chiefly relied upon to restrain these gross and criminal expressions of immorality.

Law and public opinion work at this lower end of the ethical series, while intellectual and ethical education work at the upper and initial end. Law and public opinion attack immorality in its results; intellectual and ethical education attack it in its sources. Law and public opinion deal with immorality in its last stages when it has developed itself into tangible acts. Intellectual and ethical training deal with it in its origin, in its initial possibilities; indeed they deal with *potential immorality* before it becomes immoral. Law and public opinion are restrictive, repressive, remedial. Ethically intellectual educa-

tion is anticipatory and preventive. Law and public opinion, dealing with the tangible and demonstrative, are tangible and demonstrative in their effects, and hence have largely engrossed the attention of moralists and philanthropists. Ethically intellectual training, dealing with potential immoralities before they become actual immoralities, is intangible and undemonstrative in its effects, and has failed to command the full recognition which it merits.

These contrasted methods of attack are well illustrated in a prevalent evil, which is being rapidly undermined by the spread of the spirit of creative scholarship. I refer to pugilism, physical and intellectual. There is a physical pugilism and there is an intellectual pugilism, with all gradations between. Law and public opinion have attacked effectively its grosser tangible expressions, but have scarcely reached beyond its physical aspects. From a primitive state in which no restrictions whatever were placed upon personal encounter, with or without weapons, public opinion, followed by law, gradually imposed restrictions until encounter with weapons came to be a crime, and, at length, encounter without weapons, a misdemeanor. They have thus covered the field of the more physical and tangible. They have even advanced an important step further, and forbidden personal attack in speech and in print of certain kinds and degrees. But though law and public opinion have entered upon this great field, they have scarcely made themselves felt in it, and there remains a marked contrast between the prevalence of physical pugilism and the prevalence of intellectual pugilism. Physical pugilism has been banished to the lower classes, but intellectual pugilism pervades the press, the pulpit, the platform, and the private walks of life. Personal encounter with the fists is under the ban of law and public opinion; but personal encounter with the tongue and the pen finds expression in levels where the other is unknown. To strike with the fist is beyond all thought in the better

grades of society ; to strike with the tongue grossly lies also under reproach, but to strike with the tongue adroitly too often escapes condemnation not only, but even calls forth admiration. The morality of the fist is a full century in advance of the morality of the tongue. Literal John Sullivanism is under contempt among all cultivated people, but intellectual John Sullivanism, if sufficiently skillful, finds many an admirer in the galleries that look down upon legislative halls, in many a cushioned pew, even though bathed in "dim religious light." To thrash a ruffian has ceased to be an approved method of moral reform, but to thrash a congregation, a party, or a society, is still in common, if not in good, practice.

If we rise a grade higher, we find widely, if not universally, prevalent attack in thought which does not find expression even in words ; a spirit of pugilism unexpressed in tangible form but scarcely the less pervasive and mischievous.

Into this realm of the immoral, the concealed, the intangible immoral, law can make no advance, and public opinion is relatively impotent. The remedy must come from the opposite source. The polemic element in the mental constitution, the relic of savage contests and still more ancient beastly battles, is to be eradicated by working at the fountains of thought and of feeling and by training the fundamental intellectual and ethical activities. The polemic habit in thought and in feeling has held sway through all the earlier ages of mind development and still holds wide dominance in the domains of opinion and belief. It has in some measure been banished from the domain of precise thought and from the more scientific and scholarly circles. Nevertheless some of our so-called scientific discussions have been altogether worthy to be ranked with the disputations of the middle ages. But the leaven of the spirit of impartial inquiry, of supreme devotion to the unqualified truth are rapidly banishing personal disputations and the contentious war of opinion, and substituting therefor judicial inquiry and impartial presentation.

There is an important aspect of personal morals which is destined to feel the force of the spirit of impartial inquiry, of discriminating perception, of reserved judgment and of strict regard for truth, which characterize scientific study. If I were called upon to name the greatest evil of our times, above the grade of the grossly criminal, that evil which brings the most poignant suffering to the most sensitive souls, that evil from which all suffer, and that sin of which all are guilty, I think I should name *misconstruction of personal actions and motives*, embracing in its train false interpretations, libelous thoughts, issuing in libelous words, and stretching on down through its gradations of guiltiness until it reaches the lowest, most cowardly, most heinous, blackest of crimes, the crime of character-assassination. By as much as character is dearer to every noble man than life, by so much is character-assassination deeper in criminality than the assassination of the body. He who points at your person the weapon of death faces a punishment of equal degree, and is entitled to whatsoever consideration courage may merit in the accomplishment of an evil deed ; but he who points at your reputation the deadly weapon of character-assassination, encounters no such risk, nay, too often he stands loftily up and pharisaically plumes himself upon his superior moral altitude while he strikes the dagger through that which is dearer than life to you. Cowardice, there is none greater, pharisaical villainy, there is none blacker than that which lifts its irresponsible hand against the character of a fellow being. In its milder forms—alas in too many cases its scarcely milder forms—this evil finds a place in the press, the pulpit, the platform, the sewing circle, the club, the unnumbered places of assemblage, nay, it even finds a place in the private circle and at the hearth-stone.

In so far as this is a conscious, purposeful crime, the mild, slow, gentle influences of intellectual and ethical training are relatively impotent agencies of reform. Stronger and more direct remedies are demanded, since

the evil, in such cases, springs not from intellectual processes, but from a pronounced moral degradation. It is a declared moral disease, and drastic remedies applied directly to the abnormal functions rather than hygienic and preventive measures are needed. The slow, moral effects induced by intellectual habit might, in the course of time, undermine the sinister attitude of the mind and lead to a more wholesome condition, but a quicker and more direct remedy is needed. This is a case in which direct assault is the better strategy.

But by far the greater evil, at least the wider evil, springs not from criminal intent but from defects of intellectual action and from faulty attitudes of the mind. Misjudgment of others springs in some large part from a want of rigorous scrutiny of the evidence upon which judgment is predicated. Rumors, reports, suggestions, innuendoes are accepted without sufficient inspection. Ofttimes they bear in their very nature elements of sheer inconsistency; stories that would not bear for a moment a rigorous inspection of their coherence are accepted without scrutiny and form the basis of sinister conclusions. The habit of close inspection of all statements before acceptance, the practice of withholding judgment from imperfect data, the rule of looking upon all sides before arriving at a conclusion, in short, the fundamental scholarly habit of mind, if given full play, would eradicate the larger percentage of this enormous evil, and eliminate with it an incalculable measure of poignant suffering which the best and most sensitive natures are continually forced to endure.

Among the sinister influences now affecting our body politic, one of the most baneful, to my judgment, is the indiscriminate, wholesale, inconsiderate denunciation of our public servants. Moral denunciation has unquestionably a most important function to perform in restraining corruption and unfaithful public service. But when that denunciation is applied without individual discrimination, without a careful and conscientious regard for its justness,

it tends to defeat its own object. The honest man is from his very nature more sensitive to reflections upon his integrity than the rogue, and if they are equally lashed by the assumed reformer, or by the pharisaical preacher of civic righteousness, the greater punishment falls upon the just, while the unjust pockets the reward of his villainy, and chuckles over the smartings of his more honest fellow official, while he enjoys the price of corruption. It is indeed important that official malfeasance shall be denounced, but it is equally and more important that faithful, conscientious public service should receive the reward to which it is entitled from every good citizen, whether agreeing or disagreeing in political belief or party affiliation. It is of supreme importance that we exalt the integrity of the just, and that we protect faithfulness against calumny. To the end that just denunciation shall fall upon the unfaithful and just honor upon the upright, it is the duty of every good citizen to scrutinize with the utmost skepticism every accusation directed against a public servant, testing its inherent character, weighing it in the balances of impartiality, withholding credence unless it be supported by evidence; in short, putting it to the same tests to which the student of science subjects natural phenomena before he accepts its indications, or assumes to form a judgment upon it. It is a function of investigative study to introduce into the social and political atmosphere those habits of impartial scrutiny, of conservative judgment and of regard for the exact truth which are calculated to protect the innocent and bring down upon the guilty the full and conclusive evidence of their criminality. The spread of investigative study, increasing as it must necessarily these truth-searching habits of the mind, will slowly but surely develop more just, and therein more effective, personal treatment of public officials.

The extension of the impartial methods of thought and the catholic sympathies which are pre-requisites of crea-

tive scholarship, must, in the very nature of the case, diminish that partisanship of spirit and that partiality of inquiry and of presentation, which are pronounced evils in our political world. In so far as men become lovers of the exact and the full truth in all its many-sidedness, in so far will they cease to be narrow partisans. Men will still continue to believe that one line of policy is better than another, and will still repose more confidence in one organization of citizens for political purposes than in others, but they will yield less servile devotion to partisan measures and party leaders. Men will cease to see in any one policy or party the summation of all good, and in others the summation of all evil; will fail to see in the exponents of one party the perfection of personal wisdom and integrity, and in the exponents of the opposite party the aggregation of all folly and corruption, because impartial inquiry will show its falsity. Four years ago there went up from one political host the cry "turn the rascals out," and there came up from the other political host the answering cry "keep the very hungry and very thirsty from the fountains of government." The change came, and a most rigid investigation of the records of the government failed to show any notable malfeasance in office, and I venture the prediction that if a reversal of administration shall follow the coming election, no prevalent corruption will be found in the conduct of the government. The charge of rascality does not, I think, in the cool judgment of the careful student, lie against any of the major organizations of the American people or their chosen representatives as a class. In so far as men become accustomed to make close discriminations and to arrive at careful judgments will they find that there is a mingling of good and of evil in all organizations, and in all policies, and that the task of the real patriot is to evaluate these as they are applied to men, measures and parties, and to be guided by the results rather than by servile party fealty. Measures the most just in general, are unjust in particular.

Measures the most beneficent on the whole are injurious in the individual instance. No narrow rule, no mere platform, no simple set of measures will be found adequate to the solution of all the complex problems of civic growth and governmental administration. The solution must come through a most careful and conscientious study of each problem in all its multifarious aspects, and the higher the investigative spirit and the lower the partisan spirit, the more hopeful the results.

The propagation of the spirit of untrammelled inquiry is working, and is destined still more fruitfully to work, a beneficent modification in the phases of religious thought. A genial change is gradually creeping over the theological discussions of our times, and bringing with it broader sympathies, a more truth-reverent spirit, a more just recognition of the good and the ill in current doctrines. More important perhaps than all is the recognition that the more sacred the field of thought, the more imperative is the obligation to enter upon it freed from bias, trained to the utmost precision in discrimination, possessed by the highest candor of spirit and equipoise of temper, and inspired by absolute devotion to the truth. If the truth be here more sacred than elsewhere, the more sacred is the duty that unalloyed truth be discovered, and the more assiduously is it to be sought; and he who here would bind the wings of thought is he who would restrain thought from its highest, its loftiest, its purest, its most sacred flights.

The spirit of creative scholarship has yet another important function to perform in the fullness of its influence, the guidance and restraint of reformatory movements. It is but natural that when the consideration of an evil has become entrenched upon a mind, that it should magnify itself until it gradually mounts up before the view in its amplitude and shuts out the vision of other truths; and so the mind is led, in its warfare against a special evil, to overstep the bounds of just judgment in other relations, and transgress the limits of wis-

dom and prudence. This danger become especially imminent when the evils to be reformed reside in others and not in ourselves. Reformatory movements are herein liable to excess injurious to themselves and harmful to other interests that also demand consideration. These excesses do indeed direct attention more pointedly to the evils sought to be removed, but it is to be questioned whether this good compensates for the evil of the excess. Certainly to the scientific judgment any swerving from the truth falls under moral condemnation even though its purpose be reform, though its inspiration be moral enthusiasm, and though its efforts be directed against an acknowledged evil. Scientific thought postulates as a fundamental axiom that supremely laudable results are only to be reached by integrity of intellectual action in every particular, in every stage of progress, and in every expression of enunciation. It assumes that men will be led to the acceptance of the better in thought and in action, more surely and more rapidly, in the end, by a precise, candid presentation of truth, than by exaggeration or undue emphasis. The dangers of reaction from an unwholesome enthusiasm and the bitter after-taste of an untruthful statement are thereby avoided.

Turning for a moment to individual virtues it may be remarked that impartial devotion to truth antagonizes undue self-regard. The habit of impartial scrutiny must often reveal one's own weakness. The judicial attitude of mind forces one to step out from himself and view his own positions and personal relations in the same damaging light as those of others. All opinions stand alike before the true student. The opinions of yesterday are things of yesterday. One's old opinions are, as all old opinions, entitled to respect in the precise measure of their truthfulness, and in no other, save as historic relics. It is indeed a lofty moral attitude. It is indeed superhuman to sit in judgment upon one's own opinions, robed in the same judicial ermine with which one enwraps him-

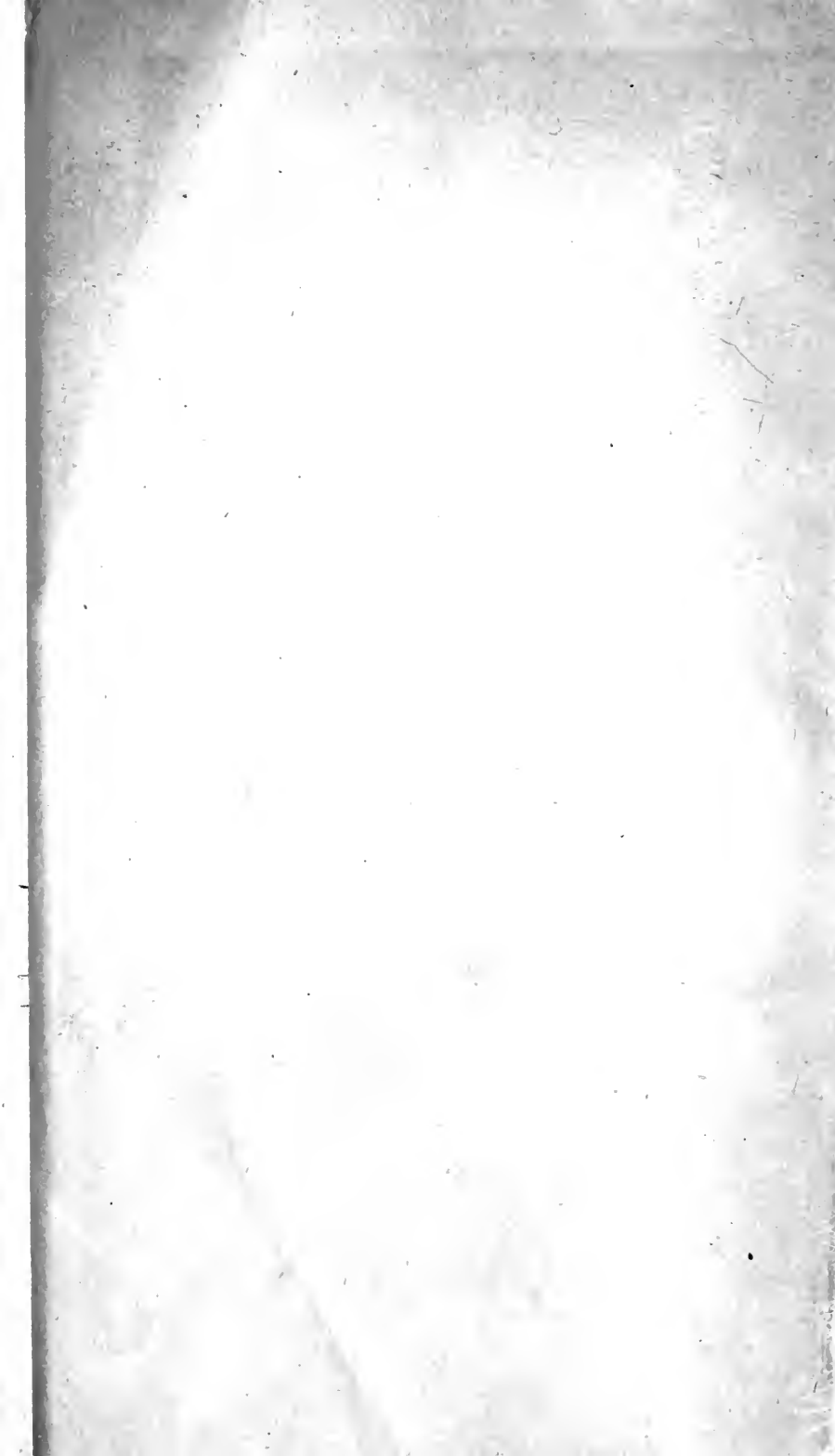
self when he adjudicates the opinions of others. From our very nature our affections go forth to our own intellectual children, and to treat them as we would treat the offspring of others is in contravention to the law of parental affection. We only avoid this by rising into the higher plane of affection which embraces within its reach all intellectual creations in the impartiality of a universal affection. To this lofty habit we fail to attain, but it is the function of the catholic and candid search for the truth to lead us upward to those lofty realms.

So likewise, in so far as devotedness to truth frees us from our natural partialities, it fosters candor in thought and action. This candor is often an expression of the highest moral courage; a loftier and truer courage than springs from personal bravery, or pride of opinion, or self-conceived heroism. It is the courage of simple conviction. It is not the courage of the intellectual warrior clashing swords with an antagonist over some battled question in which marshaled antagonisms enter to stimulate the individuality, but rather that pacific courage which rests its confidence in the ultimate triumph of its own truthfulness, which puts forth its conclusions, not in battle array, but simply in their logical relations, trusting not to any marshaling against attack, but rather to their inherent strength. It is the refined courage of intellectual peace, not the gross courage of intellectual war. The calmness with which the author of the most wide-reaching of modern hypotheses set forth his array of facts and inferences, and the quiet, courageous and noncombative spirit with which he received the onslaught made upon him from all quarters of the heavens, constitutes one of the sublimest examples of serene personal courage that human history has witnessed. Great as has been the intellectual contribution of Mr. Darwin to the thought of his time, it is perhaps scarcely greater than the moral influence of his supremely candid spirit.

I had hoped to find a remaining moment in which to

invite your attention to other ethical effects of investigative study, and especially to the important consideration that in so far as candid and impartial habits of mind are developed, in so far as there is laid the ground-work of hope for the propagation of all doctrines that have in themselves the elements of truth. It is in the interest of every sect and party which really embodies truth and depends upon this embodied truth for its success, that an inquiring and impartial spirit should become prevalent, for it is only from minds controlled by such a spirit that converts to the truth can be rationally expected. But upon this I may not dwell.

The summation of my argument is this: investigative study calls into continuous exercise certain noble activities and attitudes of the mind; to love the truth supremely, to seek the truth assiduously, to scrutinize evidence rigorously, to withhold judgment when evidence is insufficient, to look upon all sides equally, to judge impartially and to make conscientious corrections for personal bias. The continued exercise of these sterling activities during the formative stages of the mind develops corresponding fixed habits of thought and forms a permanent disposition which influences all subsequent action for good. This disposition displaces other dispositions upon which immoral tendencies more easily implant themselves. It thus works at the very source from whence spring moral issues. Its effects are slow and unobtrusive, but radical and pervasive.



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